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## COMPOSITION AND FOOD VALUE OF BEER

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The food value of any given article depends upon the extent to which it can supply certain essential dietary factors in forms available to meet the nutritional needs of an animal. In the light of our present knowledge these factors include protein, fats, carbohydrates (sugars and starches), mineral elements, and vitamins. Fats and carbohydrates are primarily the fuel material which supply our bodies with energy. Proteins also supply energy, but their chief function lies in furnishing material for the construction of nitrogenous tissues such as muscle, skin, and hair. They enter into the composition of practically every tissue of the body. Mineral elements such as calcium, phosphorus, sulfur, and iron are required for the formation of bones, and are essential constituents of all body tissues. The recently discovered vitamins are necessary for growth and the maintenance of life and health.

The following average analysis of 258 samples of lager beer is given by Leach (1):

	<u>Per cent</u>		<u>Per cent</u>
Specific gravity .....	1.0162	Sugar (as maltose) ....	0.88
Water .....	90.08	Gum and dextrin .....	3.73
Carbonic acid .....	0.196	Acid (as lactic) .....	0.151
Alcohol (by weight) .....	3.93	Glycerin .....	0.165
Extract .....	5.79	Ash .....	0.228
Nitrogenous substances ..	0.71	Phosphoric acid .....	0.077

The average percentage composition of the ash of 19 samples of German beer is thus given by Leach (1): (The average percentage of ash in the beers analyzed was 0.306.)

Potash .....	33.67	Phosphoric acid .....	31.35
Soda .....	8.94	Sulfuric acid .....	3.47
Lime .....	2.78	Silica .....	9.29
Magnesia .....	6.24	Chlorine .....	2.93
Iron oxide .....	0.48		

### Vitamins

Beer contains little, if any, vitamins. Browning (2) states that "both beer and wine seem to be very low in vitamin B content. According to Scheunert and Schieblich, dark beer prepared from rye seedlings and tested on rats and pigeons had a very small vitamin B content, even smaller than that found in porter."

Harden and Zilva (3) found that malt from barley contains vitamin B, and that vitamin C is present in the green malt, but not in kilned malt. However, neither vitamin B nor vitamin C was found in beer. As far as known, neither does beer contain vitamin A nor vitamin D.

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### Energy Value

According to Lusk (4), "a liter of German beer contains 3 to 4 per cent alcohol. It yields 450 calories to the body, only half being derived from alcohol, the rest from the dextrin and protein-like extractives." Accordingly, a pint of beer would furnish about 225 calories. Alcohol will contribute in the human body approximately 7 calories per gram.

The quantities of the food constituents (proteins, fats, carbohydrates, ash constituents, and vitamins) present in beer as given in the foregoing data are so low that this beverage must be accorded a relatively low food value.

### References

- (1) Leach. Food Inspection and Analysis, 4th Ed., 1920. John Wiley and Sons, New York.
- (2) Browning. The Vitamins. 1931. Williams and Wilkins Company, Baltimore.
- (3) Harden and Zilva. Biochem. Zeits., 1927, Vol. 186, p.229.
- (4) Lusk. The Science of Nutrition, 3d Ed., 1921. W. B. Saunders Co., Philadelphia.